

### **REMARKS**

Amendments to claims 31 and 53 are for the purpose of clarifying what Applicant regards as the claimed invention. Support for the amendments can be found at least in paragraph 84 of the subject application, which discloses examples of “non-volatile” and “volatile” media, which are tangible and non-transitory. Thus, no new matter has been added.

#### **I. Claim Rejections under 35 U.S.C. § 101**

Claims 13 and 53 stand rejected under 35 U.S.C. § 101. Applicant believes the Examiner meant claim “31.” Claims 31 and 53 have been amended in accordance with the Examiner’s recommendation to describe that the medium is “tangible” and “non-transitory.” Thus, claims 31 and 53 should satisfy § 101.

#### **II. Claim Rejections under 35 U.S.C. § 112**

Claims 63-64 stand rejected under 35 U.S.C. § 112, first paragraph. Applicant believes that the Examiner meant to reject claims 64-66. Claim 64 recites that the act of determining whether the object has moved *does not require a determination of an amount of movement by the object* (Emphasis Added). Claim 65 recites that the means for determining whether the object has moved is configured to determine whether the object has moved *without determining an amount of movement by the object* (Emphasis Added). Claim 66 recites that the act of determining whether the object has moved *does not require a determination of an amount of movement by the object* (Emphasis Added).

Applicant respectfully submits that the subject matter of these claims is supported by at least paragraphs 73-78 of the subject application (paragraphs 75-80 in the published application). In particular, paragraph 73 describes that it may be desirable to determine whether “there is target object movement” in situations in which “it may not be necessary to determine how much an object has moved.” Also, paragraphs 73-78 describe an embodiment of a method for determining whether there is object movement in situations where it is “not . . . necessary to determine how much an object has moved” (paragraph 73). Thus, the applicant of the subject application clearly has possession of the subject matter of claims 64-66 in view of paragraphs 73-78 of the subject application at least as of the date of the application (Note that the test of

written description under § 112 is whether the inventor(s) has possession of the claimed subject matter, not whether the exact same claim term is used in the specification).

According to page 7 of the Office Action, paragraph 7 of the subject application describes that a method is used to detect a patient's position, and therefore, the subject matter of claims 64-66 are allegedly in conflict with the description of paragraph 7. However, Applicant respectfully notes that paragraph 7 describes an embodiment that corresponds with figures 2 and 7 (not figure 11). Also, figure 11 describes a different embodiment of a method, which is for situations in which "it may not be necessary to determine how much an object has moved" (see paragraph 73). In particular, figure 11 describes an embodiment of a method that is for determining whether there is object movement in situations where it is "not . . . necessary to determine how much an object has moved" (paragraph 73). Thus, the subject matter of claims 64-66 is in fact supported by the specification.

For at least the foregoing reasons, Applicant respectfully requests that the § 112 rejection be withdrawn.

### III. Objection to the Specification

The specification stands objected to because the subject matter of claims 64-66 allegedly is not described in the specification. Applicant believes that the remarks addressing the § 112 rejection have rendered the objection to the specification moot.

### IV. Objection to the Drawing Figures

The drawings stand objected to because the features of claims 64-66 are not shown in the drawing figures. Figure 11 was previously amended to show the features described in claims 64-66. Support for the amendment can be found at least in paragraphs 73-78 of the subject application, which describe an embodiment of a method for determining whether there is object movement in situations where "it may not be necessary to determine how much an object has moved." Thus, the objection to the drawing figures should be moot.

### V. Claim Rejections under 35 U.S.C. § 103

Claims 1-4, 6-9, 12-14, 18, 20, 23-27, 31-36, and 61-63 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. 2003/0086596 (Hipp) in view of U.S. Patent No. 5,535,289 (Ito). Applicant believes that the Examiner meant to reject claim 22 as well since the claim 22 is addressed on page 9 of the Office Action.

Claim 1 recites that the act of enhancing is performed such that an image of the moving object is enhanced relative to an image of a relatively stationary object *if* the moving object moves relative to the stationary object (Emphasis Added). Claims 22, 31, and 63 recite similar limitations. According to page 8 of the Office Action, figure 4a of Hipp allegedly discloses the above limitations. Applicant respectfully disagrees.

As an initial matter, Applicant notes that claims 1, 22, 31, and 63 describe that the act of enhancing is conditioned upon whether the object moves (note the limitation “if”). There is nothing in figure 4a of Hipp that discloses or suggests enhancing an image *if* the object moves relative to a stationary object. Rather, figure 4a illustrates an example of radiographic image showing a search model region (see paragraph 41).

Furthermore, Hipp teaches identifying a specific vertebrae, and tracking such vertebrae in the images (see paragraph 102). Thus, in Hipp, once the vertebrae is identified, any image enhancement that is performed is always for the specific vertebrae – regardless of whether it moves or not. Therefore, Hipp does not disclose, and in fact teaches away from, enhancing an image that is conditioned upon object movement.

Ito also does not disclose or suggest the above limitations, and is not being relied upon for the disclosure of the above limitations. Since none of the cited references discloses or suggests the above limitations, any purported combination of these references cannot result in the subject matter of claims 1, 22, 31, and 63. For at least the foregoing reasons, Applicant submits that the prima facie case of the § 103 rejection for claims 1, 22, 31, and 63 based on Hipp and Ito has not been established, and requests that the § 103 rejection be withdrawn.

Claim 1 also recites that *the act of enhancing is accomplished at least in part by performing image averaging and image subtraction* (Emphasis Added). Claims 22, 31, and 63 recite similar limitations. According to pages 8-9 of the Office Action, paragraph 40 of Hipp

allegedly discloses image averaging, and column 2, lines 1-3 and figure 1a of Ito allegedly disclose image subtraction.

As an initial matter, Applicant respectfully notes that the cited art of record does not support the purported motivation to combine the imaging averaging technique of Hipp with the image subtraction technique of Ito. This is because paragraph 40 of Hipp discloses performing image averaging for images that are generated in a sequence as an object moves. On the other hand, the cited passage of Ito discloses performing image subtraction for two images that are generated using different energies (low and high energies). Notably, the imaging averaging technique of Hipp is a sub-step of a method that is specifically *for tracking a moving object in a video*, while the image subtraction technique of Ito is a sub-step of a completely different method that is specifically for processing images generated using different energies *for improving the image of soft tissue* (see figure 1A and corresponding passages). Thus, one skilled in the art would have no reason to selectively pick two sub-steps from two completely different methods (which are for completely different purposes) in the respective references, and combine them together.

In addition, according to page 3, it appears that the Examiner is stating that since both references are directed toward boundary detection, it would have been allegedly obvious for one skilled in the art to combine the methods of Hipp and Ito. However, Applicant notes that contrary to the Examiner's characterization, Ito is not specifically directed to boundary detection. Rather, Ito is directed to processing image so that the soft tissue is more clearly shown (see figure 1A, and corresponding description).

For these additional reasons, Applicant submits that the prima facie case of the § 103 rejection for claims 1, 22, 31, and 63 based on Hipp and Ito has not been established, and requests that the § 103 rejection be withdrawn.

Applicant notes that the above arguments have not been considered and addressed by the Examiner. Thus, to the extent that the Examiner is inclined to maintain the claim rejections, Applicant respectfully requests that the above arguments be considered and addressed.

Claims 40, 43, 46, 47-49, 50, 53, and 56 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,075,557 (Holliman) in view of Hipp.

Claim 40 recites that the act of determining whether the object has moved comprises *using a contrast associated with the first composite image* (which is obtained by performing a subtraction function) (Emphasis Added). Claims 50 and 53 recite similar limitations. According to page 20 of the Office Action, Holliman does not disclose that the first image is a composite image. However, Applicant also notes that the beginning of the same paragraph on page 20 of the Office Action states that element 49 in figure 12 of Holliman allegedly discloses a composite image. To the extent that the Office Action is relying on element 49 in figure 12 of Holliman for the alleged disclosure of a composite image, Applicant submits that such passage of Holliman does not disclose or suggest a composite image. Rather, element 49 of Holliman actually discloses template matching between a template and an image area (see figure 12), and therefore, the element 49 does not disclose or suggest a composite image.

Also, contrary to the Examiner's characterization of element 49 that it discloses a composite image, Applicant respectfully notes that element 49 in figure 12 actually states "Template matching by finding the position where there is a best correlation between the template and the underlying image area." Thus, the template matching in Holliman actually involves using correlation between the template and an image area, and does not involve determining a composite image. Notably, the correlation determination results in a "correlation value" (see element 50 of figure 12), which is a number, and therefore, is clearly not a composite "image."

Page 20 of the Office Action also cites to column 11, lines 33-38 of Holliman for the disclosure of a "differential movement method," and states that such method "is used to create a composite image between the template and the input image." However, as discussed, Holliman discloses template matching that results in a single value, not a composite image. Thus, based on the Examiner's characterization of Holliman, the differential movement method for the alleged template matching actually results in a value, not an image. This is further evidenced by the description in Holliman, describing that the cross-correlation value at the best-matched position resulted from the template matching "would be 1" (c14:20-21). Thus, Holliman clearly does not disclose or suggest the above limitations.

Page 20 of the Office Action also cites to paragraph "40, lines 4-11" of Hipp. To the extent that the Office Action is relying on this passage of Hipp for the alleged disclosure of using

a subtraction function to determine a composite image, Applicant also submits that such passage of Hipp does not disclose or suggest such feature. Notably, the cited passage of Hipp discloses “averaging” adjacent images. Thus, the Hipp discloses averaging technique, which is not a subtraction function.

Since Holliman and Hipp do not disclose or suggest the above limitations, any purported combination of these references cannot result in the subject matter of claims 40, 50, and 53. For at least the foregoing reasons, Applicant respectfully submits that the prima facie case of the § 103 rejection for claims 40, 50, and 53 based on Holliman and Hipp has not been established, and requests that the § 103 rejection be withdrawn.

Applicant notes that the above arguments have not been considered and addressed by the Examiner. Thus, to the extent that the Examiner is inclined to maintain the claim rejections, Applicant respectfully requests that the above arguments be considered and addressed.

Claims 64-66 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Holliman in view of Hipp, and further in view of U.S. Patent No. 5,134,472 (Abe).

Claim 64 recites that the act of determining whether the object has moved *does not require a determination of an amount of movement by the object* (Emphasis Added). Claim 65 recites that the means for determining whether the object has moved is configured to determine whether the object has moved *without determining an amount of movement by the object* (Emphasis Added). Claim 66 recites that the act of determining whether the object has moved *does not require a determination of an amount of movement by the object* (Emphasis Added).

Applicant agrees with the Examiner that Holliman and Hipp do not disclose or suggest the above limitations. According to the Office Action, column 1, lines 43-55 of Abe allegedly disclose the above limitations. Applicant respectfully disagrees. First, Applicant respectfully notes that column 1, lines 43-55 does not disclose or suggest that an amount of movement of the object is not determined. Rather, quite the opposite, Abe in fact discloses using position data in its algorithm (See for example, claim 7 stating “generating at least two position signals corresponding to at least two positions of the moving object.”). Also, column 8, line 31 of Abe discloses  $YE_f - YE_n$ , which corresponds to an amount of movement of object from coordinate  $YE_f$  to coordinate  $YE_n$  (see figure 8B).

Since Holliman, Hipp, and Abe do not disclose or suggest the above limitations, any purported combination of these references cannot result in the subject matter of claims 64-66. For at least the foregoing reasons, Applicant submits that the prima facie case of the § 103 rejection for claims 64-66 based on Holliman, Hipp, and Abe has not been established, and requests that the § 103 rejection be withdrawn.

Applicant notes that the above arguments have not been considered and addressed by the Examiner. Thus, to the extent that the Examiner is inclined to maintain the claim rejections, Applicant respectfully requests that the above arguments be considered and addressed.

**CONCLUSION**

If the Examiner has any questions or comments regarding this response, please contact the undersigned at the number listed below.

To the extent that any arguments and disclaimers were presented to distinguish prior art, or for other reasons substantially related to patentability, during the prosecution of any and all parent and related application(s)/patent(s), Applicant(s) hereby explicitly retracts and rescinds any and all such arguments and disclaimers, and respectfully requests that the Examiner re-visit the prior art that such arguments and disclaimers were made to avoid.

The Commissioner is authorized to charge any fees due in connection with the filing of this document to Vista IP Law Group's Deposit Account No. **50-1105**, referencing billing number **VM 03-009**. The Commissioner is authorized to credit any overpayment or to charge any underpayment to Vista IP Law Group's Deposit Account No. **50-1105**, referencing billing number **VM 03-009**.

Respectfully submitted,

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